EV6532-F-00A

5V to 60V, Three-Phase Brushless DC Motor Pre-Driver Evaluation Board

DESCRIPTION

The EV6532-F-00A is an evaluation board for the MP6532, a three-phase brushless DC motor pre-driver.

The MP6532 operates from a supply voltage of up to 60V. It is configured to drive three half-bridges consisting of six N-channel power MOSFETs. The rotor position information is provided by the Hall sensors assembled in the motor, and the driving control signals are generated by an external controller, such as an MCU, or FPGA.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input voltage	V_{IN}	5 to 60	V
OC_REF	OC_REF	0.1 to 2.4	V
Hall voltage	V_H	3.3 or 5	V

FEATURES

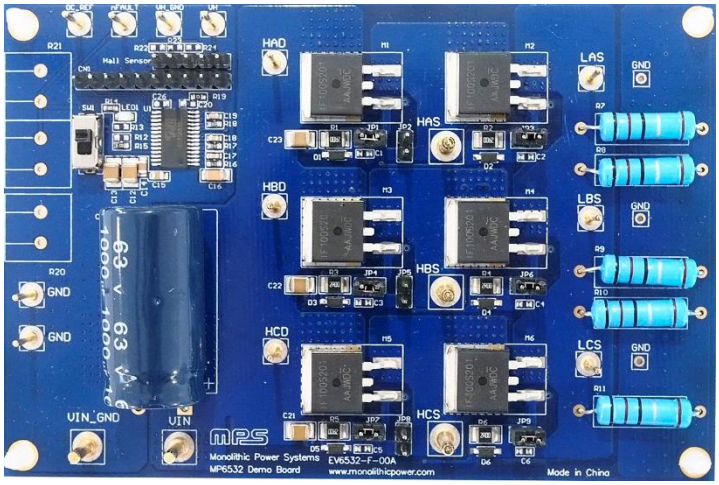
- Wide 5V to 60V Input Voltage Range
- Configurable OCP Threshold
- Supports 100% Duty Cycle Operation
- OCP and OTP
- Fault Indication Output

APPLICATIONS

- Three-Phase Brushless DC Motors and Permanent Magnet Synchronous Motors (PMSMs)
- Power Drills
- Impact Drivers
- E-Bikes

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EV6532-F-00A EVALUATION BOARD



(LxWxH) 11.7cmx7.8cmx1cm

Board Number	MPS IC Number
EV6532-F-00A	MP6532GF

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QUICK START GUIDE

1. Attach the input voltage (5V ≤ V_{IN} ≤ 60V) to the VIN connector, and attach the input ground to the GND connector.
2. To enable the chip, attach a 3.3V or 5V constant voltage to the VH connector, then switch SW1 to position 1 (top side).
3. To set the OCP threshold, attach the over-current protection (OCP) reference voltage (0.1V ≤ V_{OC_REF} ≤ 2.4V) to the OC_REF connector.
4. Attach the Hall signals coming from the motor to the CN1 connector. Attach the Hall sensor power supply to the Hall sensor connector.
5. Attach the driving control signals generated by the external controller to the CN1 connector.

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EVALUATION BOARD SCHEMATIC

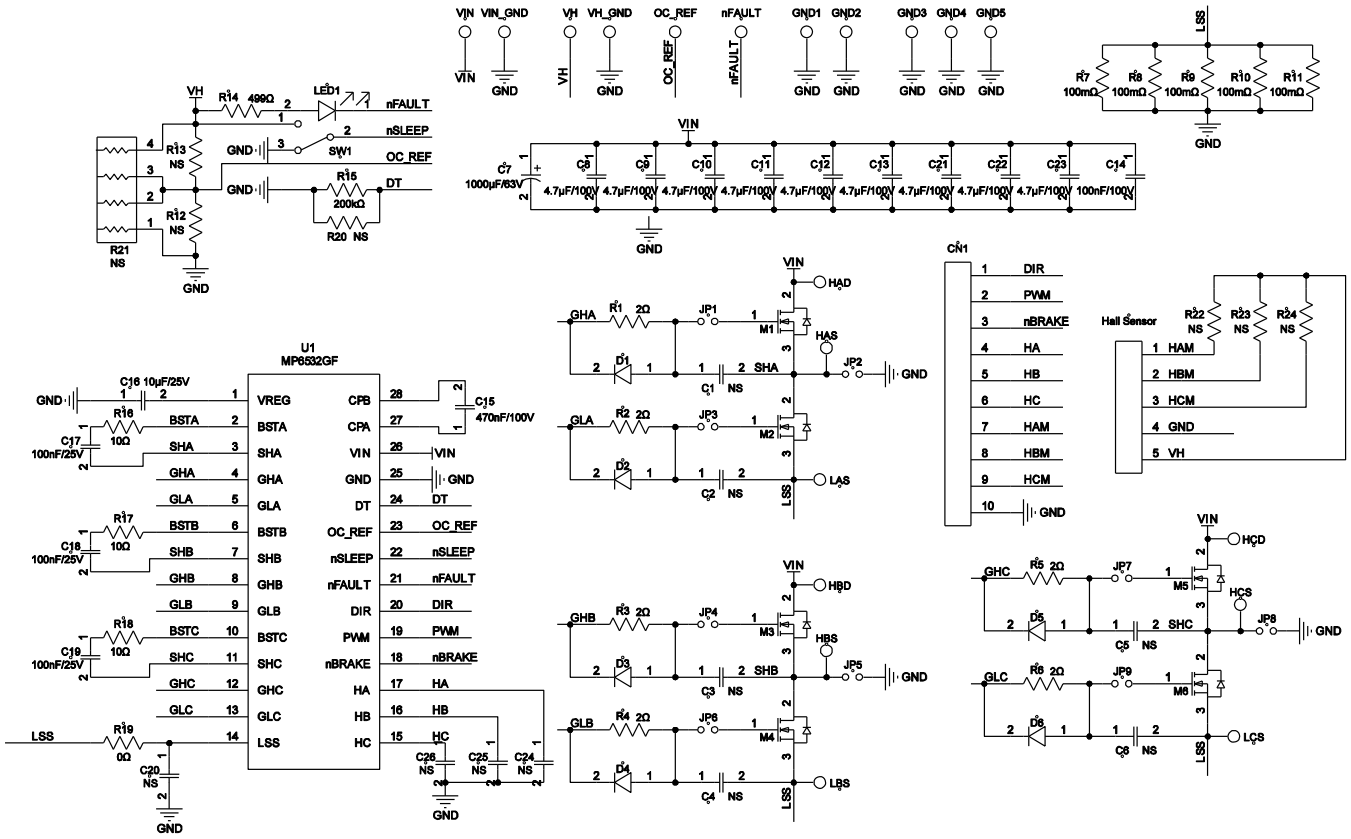


Figure 1: Evaluation Board Schematic

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EV6532-F-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
17	C1, C2, C3, C4, C5, C6, C20, C24, C25, C26, R12, R13, R20, R21, R22, R23, R24	NS				
1	C7	1000µF	Electrolytic capacitor, 63V	DIP	Jianghai	CD263-63V1000
9	C8, C9, C10, C11, C12, C13, C21, C22, C23	4.7µF	Ceramic capacitor, 100V, X7S	1210	TDK	C3225X7S2A475K
1	C14	100nF	Ceramic capacitor, 100V, X7R	0805	TDK	CGA4J2X7R2A104K
1	C15	470nF	Ceramic capacitor, 100V, X7R	0805	Murata	GRM21BR72A474KA 73L
1	C16	10µF	Ceramic capacitor, 25V, X5R	1206	Murata	GRM31CR61E106KA 12L
3	C17, C18, C19	100nF	Ceramic capacitor, 25V, X7R	0603	Murata	GRM188R71E104KA 01D
6	R1, R2, R3, R4, R5, R6	2Ω	Film resistor, 1%	1210	Yageo	RC1210FR-072RL
5	R7, R8, R9, R10, R11	100mΩ	Resistor	DIP	Minda	100mΩ/2W
1	R14	499Ω	Film resistor, 1%	0603	Yageo	RC0603FR-07499RL
1	R15	200kΩ	Film resistor,1%	0603	Yageo	RC0603FR-07200KL
3	R16, R17, R18	10Ω	Film resistor,1%	0603	Yageo	RC0603FR-0710RL
1	R19	0Ω	Film resistor,1%	0603	Yageo	RC0603FR-070RL
6	D1, D2, D3, D4, D5, D6	30V, 1A	Schottky diode	SOD-123	Diodes	B130LAW
6	M1, M2, M3, M4, M5, M6	100V	N-channel MOSFET, 100V, 57A, I_D = 28A Q_G = 130nC, 23mΩ when V_{GS} = 10V	TO-263	IR	IRF3710S
1	LED1	Red	LED	0805	Bright LED	BL-HUF35A-TRB
1	SW1	SPDT	Button	DIP	Any	
9	JP1, JP2, JP3, JP4, JP5, JP6, JP7, JP8, JP9	2-bits/ 2.54mm	Connector	DIP	Any	
6	JP1, JP3, JP4, JP6, JP7, JP9	2.54mm	Short jumper	DIP	Any	
1	CN1	10-bits/ 2.54mm	Connector	DIP	Any	

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EV6532-F-00A BILL OF MATERIALS *(continued)*

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	Hall sensor	5-bits/ 2.54mm	Connector	DIP	Any	
5	VIN, VIN_GND, HAS, HBS, HCS	Φ = 2mm	Connector	DIP	Any	
12	OC_REF, nFAULT, VH, VH_GND, HAD, HBD, HCD, LAS, LBS, LCS, GND, GND	Φ = 1mm	Connector	DIP	Any	
1	U1	60V	3-phase BLDC motor pre-driver	TSSOP-28EP (9.7mmx6.4mm)	MPS	MP6532GF

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PCB LAYOUT

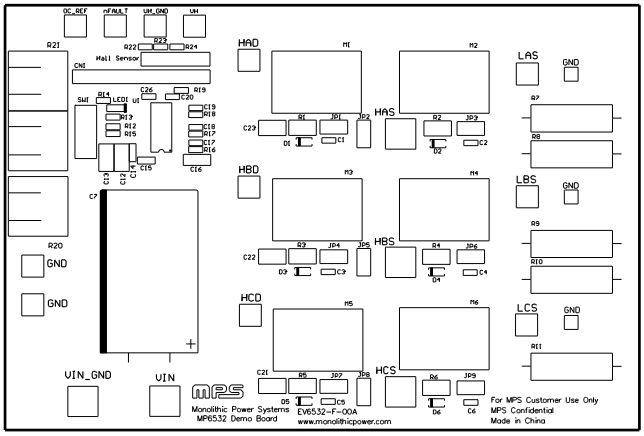


Figure 2: Top Silk

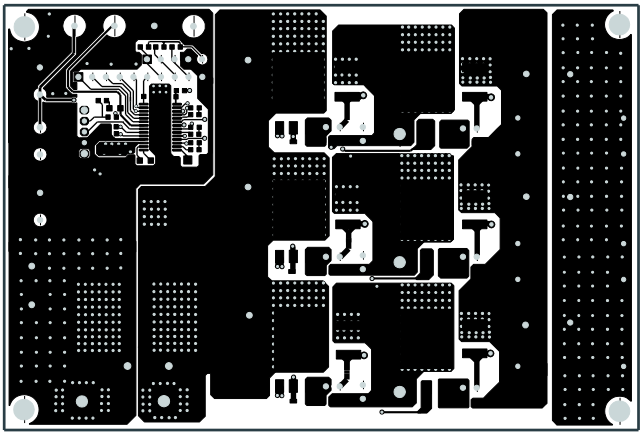


Figure 3: Top Layer

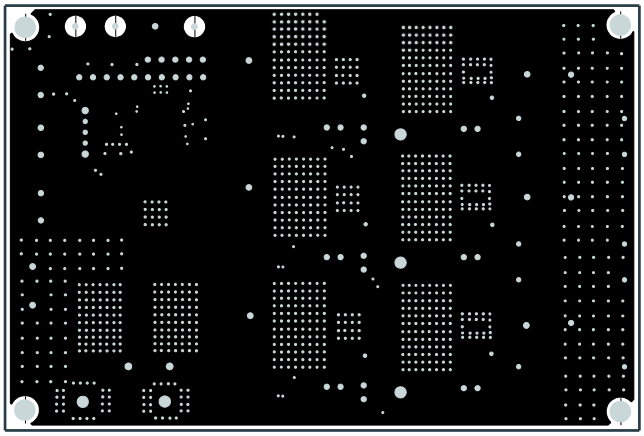


Figure 4: Inner Layer 1

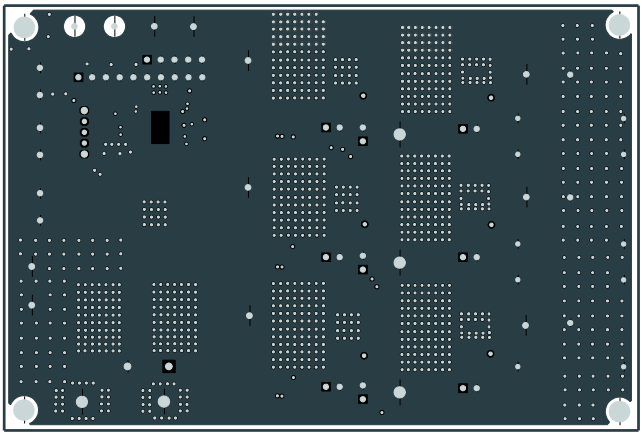


Figure 5: Inner Layer 2

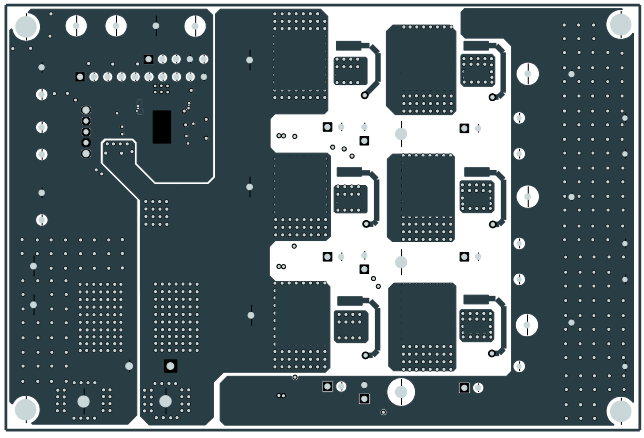


Figure 6: Bottom Layer

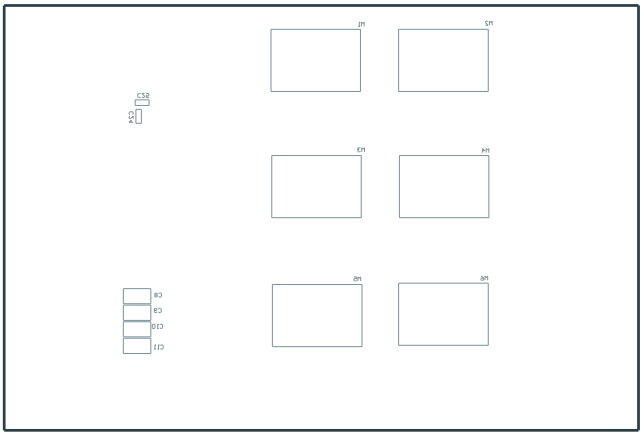


Figure 7: Bottom Silk

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Revision History

Revision #	Revision Date	Description	Pages Updated
1.0	08/10/2020	Initial Release	-

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